CLAIMS

1. A biosensor for determining a substrate concentration in a sample solution comprising a base plate having an electrode system and a reaction layer having formed thereon a space including said reaction layer, said space being provided with an introducing port for introducing said sample solution into said space and a discharge port for discharging the gas in said space by inflow of said sample solution, said electrode system being equipped with at least an electrode for measurement and a counter electrode, at least an enzyme being carried on said reaction layer, a change in concentration of a substance in the reaction between said enzyme and said sample solution being detected with said electrode system to determine a substrate concentration in said sample solution.

2. A biosensor as claimed in claim 1, wherein said electrode system comprises a plural set of electrode systems and reaction layers corresponding to said plural set of electrode systems and a common space are provided.

3. A biosensor as claimed in claim 1, wherein said electrode system comprises a plural set of electrode systems and, reaction layers and spaces corresponding to said plural set of electrode systems are provided.

4. A biosensor as claimed in claim 1, wherein an electrode system comprising at least an electrode for

measurement and a counter electrode is formed on an insulating base plate, a reaction layer is formed on the surface of said electrode system and said reaction layer comprises an enzyme layer composed of an oxidoreductase and a hydrophilic high molecular substance having formed thereon an electron acceptor layer.

5. A biosensor as claimed in claim 1, wherein an electrode system comprising at least an electrode for measurement and a counter electrode is formed on an insulating base plate, a reaction layer is formed on the surface of said electrode system and said reaction layer comprises an enzyme layer composed of an oxidoreductase and a hydrophilic high molecular substance having formed thereon an electron acceptor layer containing a surface active agent.

6. A biosensor as claimed in claim 4 or 5, wherein said electron acceptor layer comprises fine particles of an electron acceptor having a particle size
B82 of not greater than 100 μm.

7. A biosensor as claimed in claim 4 or 5, wherein said hydrophilic high molecular substance is any member selected from hydrophilic high molecular substances of starch, carboxymethyl cellulose, gelatin, acrylate, vinyl alcohol, vinylpyrrolidone and maleic anhydride or a mixture thereof.

8. A biosensor as claimed in claim 1, wherein the surface of a material constructing said space is

hydrophilic.

9. A biosensor as claimed in claim 2 or 3, wherein said electrode system comprises two sets of electrode systems comprising at least an electrode for measurement and a counter electrode mainly composed of carbon, a reaction layer composed of a hydrophilic high molecular substance and an oxidoreductase being provided on one electrode system and a hydrophilic high molecular substance layer or a layer composed of a hydrophilic high molecular substance and an inactivated oxidoreductase being provided on another electrode system.

10. A biosensor as claimed in claim 2 or 3, wherein said electrode system comprises two sets of electrode systems comprising at least an electrode for measurement and a counter electrode mainly composed of carbon, a reaction layer composed of a hydrophilic high molecular substance and an oxidoreductase being provided on one electrode system and a hydrophilic high molecular substance layer or a layer composed of a hydrophilic high molecular substance and a deactivated oxido-reductase being provided on another electrode system.

11. A biosensor as claimed in claim 9 or 10, wherein said electrode system comprises an electrode for measurement and a counter electrode mainly composed of carbon and a reference electrode comprising a silver/silver chloride ~~reference electrode~~.

12. A biosensor as claimed in claim 1, wherein said electrode system is prepared from a material mainly composed of carbon formed on an insulating base plate by means of screen printing.

13. A biosensor as claimed in claim 1, wherein an electrode system comprising at least an electrode for measurement and a counter electrode is formed on an insulating base plate, a reaction layer is formed on said electrode system and said reaction layer comprises a first layer composed of a hydrophilic high molecular substance and an oxidoreductase, a second layer composed of a hydrophilic high molecular substance and a third layer containing an electron acceptor.

14. A biosensor as claimed in claim 13, wherein said hydrophilic high molecular substance in the first layer and the second layer is selected from hydrophilic high molecular substances of starch, carboxymethyl cellulose, gelatin, acrylate, vinyl alcohol, vinylpyrrolidone and maleic anhydride or a mixture thereof.

15. A process for preparing a biosensor which comprises forming an electrode system comprising at least an electrode for measurement and a counter electrode on an insulating base plate, coating a hydrophilic high molecular substance aqueous solution and an oxidoreductase aqueous solution on said electrode system and then drying to form an enzyme layer, spreading a mixture of an electron acceptor and an organic solvent onto said enzyme layer,

removing said organic solvent to form an electron acceptor layer and then integrating together with a cover.

16. A process for preparing a biosensor which comprises forming an electrode system comprising at least an electrode for measurement and a counter electrode on an insulating base plate, coating a hydrophilic high molecular substance aqueous solution and an oxidoreductase aqueous solution on said electrode system and then drying to form an enzyme layer, next spreading a solution of a hydrophilic high molecular substance in an organic solvent onto said enzyme layer to form a hydrophilic high molecular substance layer, further spreading a dispersion of an electron acceptor in an organic solvent onto said hydrophilic high molecular substance layer to form an electron acceptor layer, and then integrating together with a cover.

17. A process for preparing a biosensor as claimed in claim 15 or 16, wherein a mixture of said electron acceptor, said surface active agent and said organic solvent is spread on said enzyme layer and said organic solvent is removed to form an electron acceptor layer.

18. A process for preparing a biosensor as claimed in claim 17, wherein said electron acceptor layer comprises fine particles of an electron acceptor having a particle size of not greater than 100 μm.